
QPC452 Basic 500/2500 Analog Line Card

Introduction

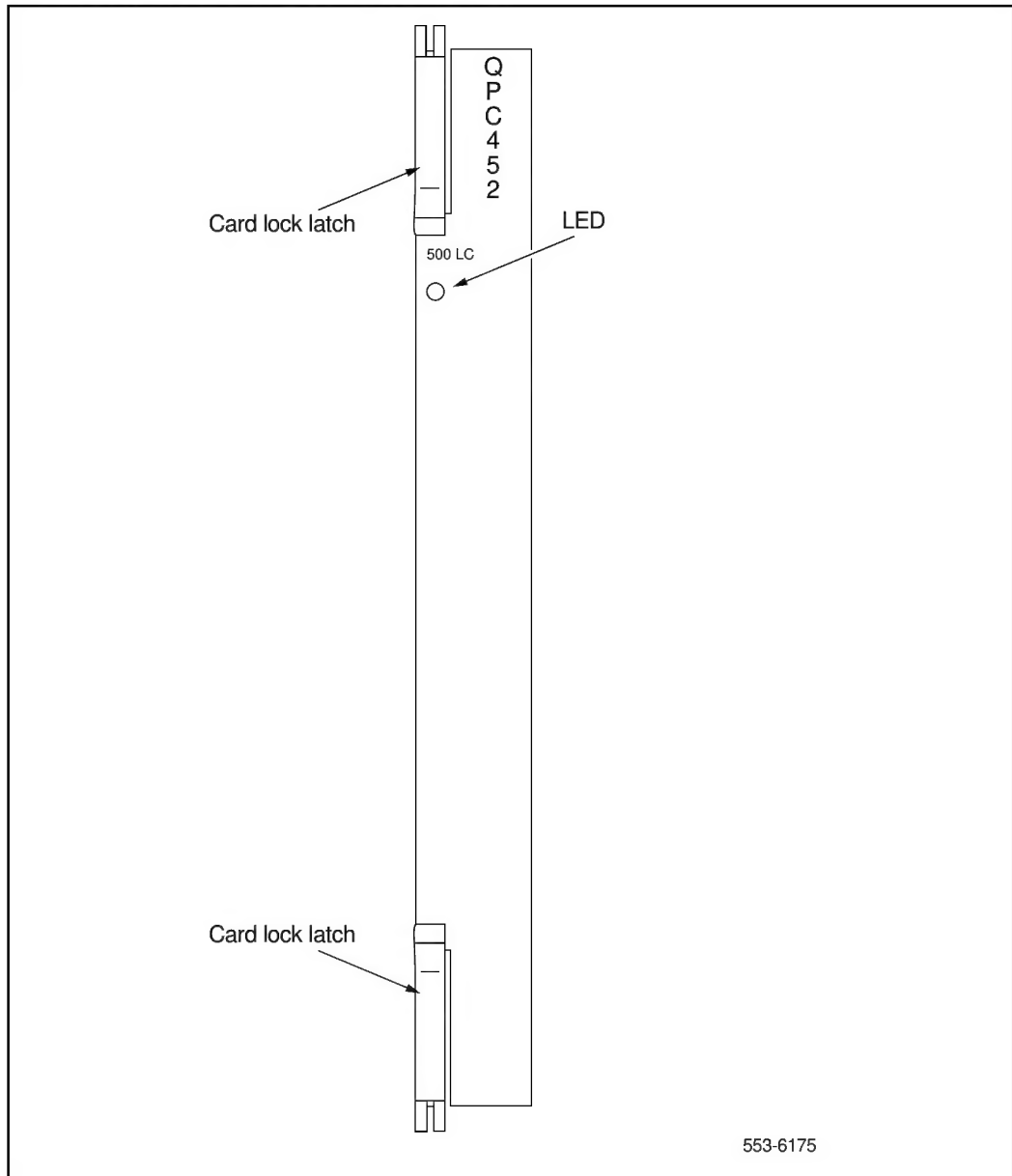
The QPC452 Basic 500/2500 Analog Line Card is a peripheral equipment (PE) device that may be installed in any peripheral shelf or NT8D13 Peripheral Equipment (PE) Module. The basic 500/2500 analog line card interfaces eight analog telephone lines to the Meridian 1 switch. Each line interface is independently configurable by software control in the Single-line Telephone Administration program (LD 10).

Physical description

The basic 500/2500 analog line card mounts in any peripheral equipment (PE) slot. The line interface and common multiplexing circuitry is mounted on a 31.75 cm by 25.40 cm (12.5 in. by 10 in.) printed circuit board.

The basic 500/2500 analog line card connects to the PE backplane through an 80-pin bus system on the backplane. In a PE shelf, the bus lines feed into seven multi-pin connectors that link the line cards to the main distribution frame (MDF), also called the cross-connect terminal. In the NT8D13 PE Module the backplane connector is cabled to the input/output (I/O) panel that is linked to the MDF through 25-pair cables. Telephone lines from station equipment cross connect to the basic 500/2500 analog line card at the MDF using a wiring plan similar to that used for trunk cards. See *Meridian 1 system installation procedures* (553-3001-210) for termination and cross-connect information.

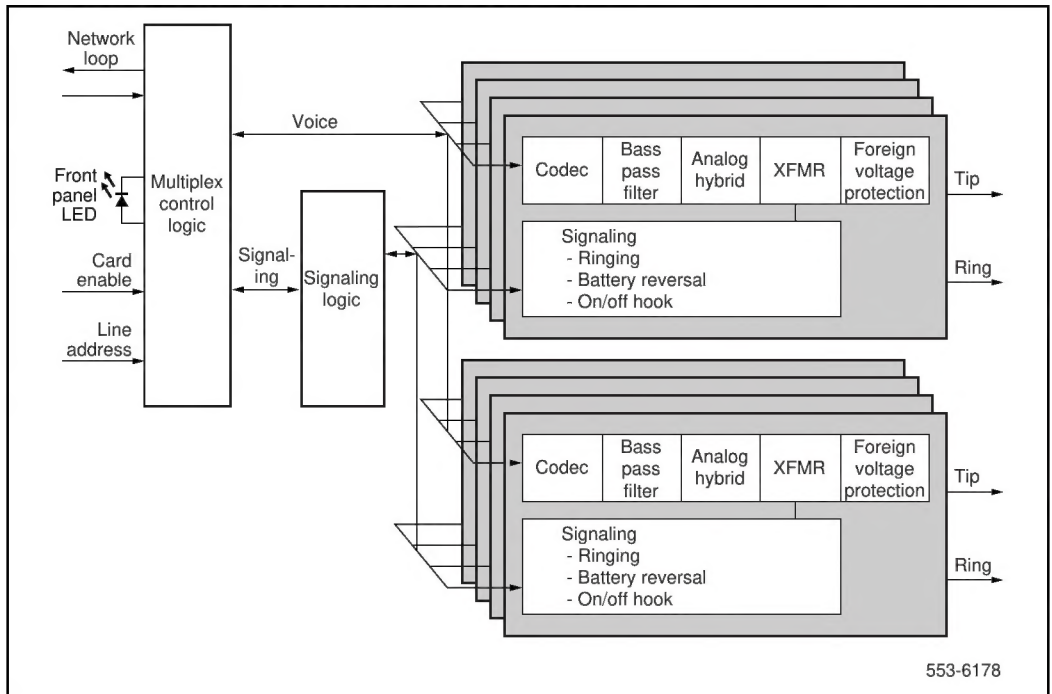
Figure 44
Basic 500/2500 analog line card—faceplate



Functional description

Figure 45 shows a block diagram of the major functions contained on the basic 500/2500 analog line card. Each of these functions are described on the following pages.

Figure 45
Basic 500/2500 analog line card—block diagram



Card interfaces

The basic 500/2500 analog line card passes voice and signaling data over network loops. This interface is discussed in detail in “Peripheral equipment” on page 23.

Line interface units

The basic 500/2500 analog line card contains eight identical and individually configurable line interface units (also referred to as circuits). Each unit provides 600 ohm impedance matching and a balancing network in a signal transformer/analog hybrid circuit. This balancing network also contains circuitry that allows conversion from a 2-wire to a 4-wire transmission path.

Relays are provided in each unit to apply ringing onto the line, and the timing of the application of ringing current is controlled to prevent switching during current peaks. These relays are disabled during the power-up cycle to prevent false ringing. The line interface units also contains signal detection circuits that monitor on hook/off hook signaling.

Codecs

Each line interface unit contains a filter and a coder/decoder (codec). Audio signals received from the telephone line are passed through a low-pass monolithic A/D filter that limits the frequency spread of the input signal to a nominal 200–3400 Hz bandwidth. The audio signal is then applied to the input of the codec. Audio signals coming from the codec are passed through a low-pass D/A monolithic filter that integrates the amplitude modulated pulses coming from the codec and then filters and amplifies the result. The codec performs A/D and D/A conversion of the line analog voiceband signal to a digital PCM signal.

Multiplex control

The multiplex control logic is common to all eight channels. This logic interfaces the individual line circuits to the peripheral bus signaling channel. Circuits are provided in the multiplex control logic to retiming the digital signals received from the peripheral bus. Circuits are also provided to decode the address information contained on the peripheral bus to enable the individual line circuits during their selected time slots. Further, logic is provided to enable or disable the front panel LED to indicate the service state of the card.

Electrical specifications

This section lists the electrical characteristics of the basic 500/2500 analog line card.

Analog line interface

[Table 49](#) shows the electrical characteristics of the analog line interface.

[Table 50](#) shows the maximum number of voice call recommended as the loop resistance changes.

Table 49

Basic 500/2500 analog line card—line interface electrical characteristics

Characteristic	Specification
Terminal impedance (TIMP)	600 ohms
Balance impedance (BIMP)	600 ohms
DC signaling loop length (max) with two ringers	1000-ohm loop (excluding resistance of telephone set) with nominal battery of –8 V dc
Battery supply voltage	–42 to –52.5 V dc
Minimum detected loop current	20 mA
Line leakage	≥ 30k ohms, tip-to-ring, tip-to-ground, ring-to-ground
Ring Trip	During silent or ringing intervals
Signaling	Loop start
Insertion Loss	5, ±1 dB at 1020 Hz

Table 50**Basic 500/2500 analog line card—maximum number of voice calls recommended**

Loop Resistance (Ohms)*	17 mA**	20 mA
up to 40	2	2
41 to 100	2	1
101 to 250	2	1
251 to 1000	1	1
* Loop resistance excludes the impedance of the telephone.		
** 17 mA/20 mA is the current that a typical telephone requires in an off-hook condition.		

Power requirements

[Table 51](#) shows the maximum current that the QPC452 Basic 500/2500 Analog Line Card requires from each power supply.

Table 51**Basic 500/2500 analog line card—power requirements**

Voltage	Idle current (mA)	Active current (mA)
2.5 V, $\pm 0.5\%$	< 0.1	< 0.1
+6 V, $\pm 1\%$	50	140
−6 V, $\pm 1\%$	50	140
−48 V, $\pm 3\%$	1	320
−52 V, $\pm 4\%$	1	85

Foreign and surge voltage protections

When telephone lines connected to the 500/2500 line cards may be exposed to foreign voltages by direct contact or induction (power line crosses or lightning, for example), protection devices must be installed on the customer's premises. These devices must be capable of providing a path to ground from tip and ring for foreign voltages that exceed 600 V peak.

Environmental specifications

[Table 52](#) shows the environmental specifications of the card.

Table 52
Basic 500/2500 analog line card—environmental specifications

Parameter	Specifications
Operating temperature	0° to +60° C (+32 to +140° F), ambient
Operating humidity	5 to 95% RH (noncondensing)
Storage temperature	–40° to +70° C (–40° to +158° F)

Connector pin assignments

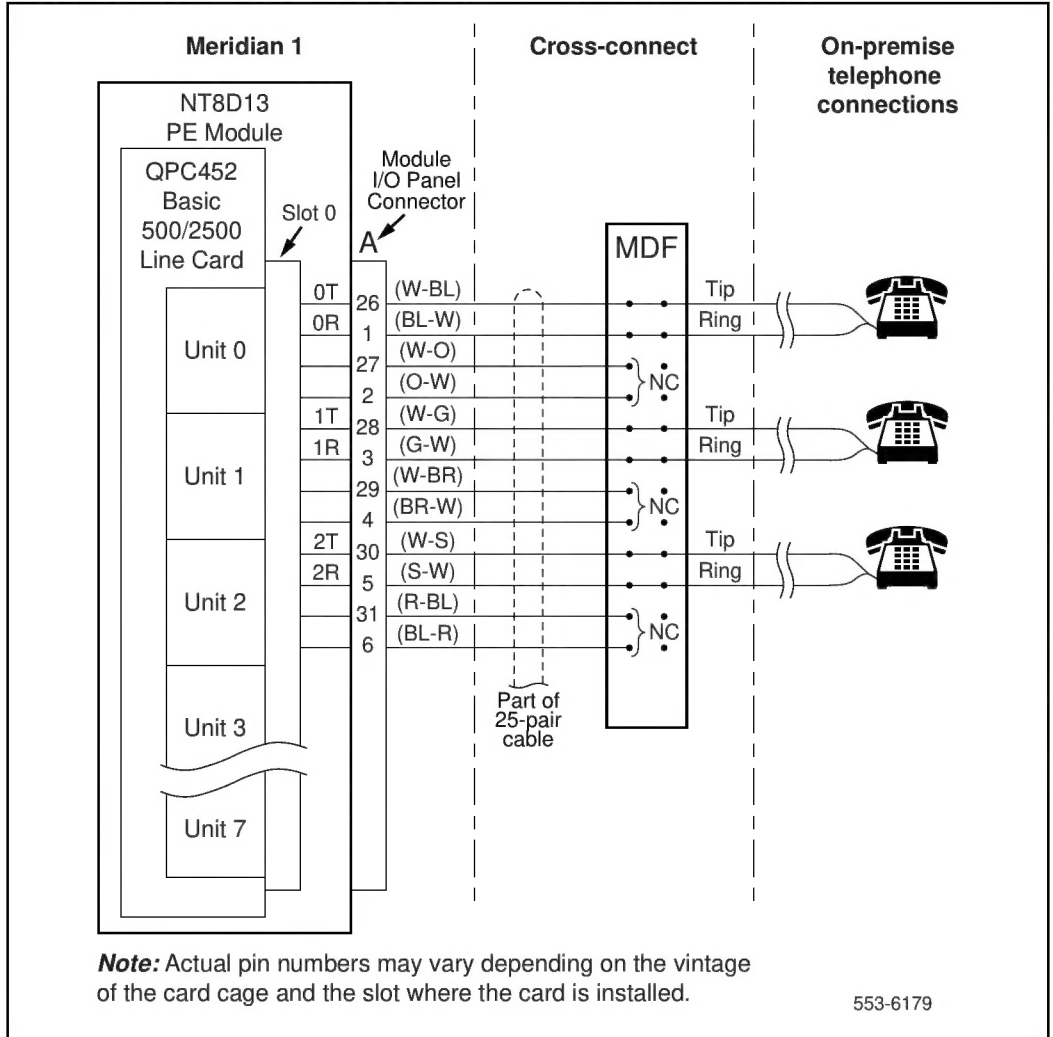
The basic 500/2500 analog line card brings the eight analog phone lines to the PE backplane through an 80-pin bus. In a PE shelf, the bus lines feed into seven multi-pin connectors that link the line cards to the main distribution frame (MDF), also called the cross-connect terminal. In the NT8D13 Module the backplane connector is cabled to the input/output (I/O) panel that is linked to the MDF through 25-pair cables.

Telephone lines from station equipment cross connect to the basic 500/2500 analog line card at the MDF using a wiring plan similar to that used for trunk cards. A list of the connections to the analog line card are shown in [Table 53](#), and a typical connection example is shown in [Figure 46](#). See *Meridian 1 system installation procedures* (553-3001-210) for complete I/O panel information and wire assignments for each tip/ring pair.

Table 53
Basic 500/2500 analog line card—backplane pinouts

Pin	Signal	Pin	Signal
36A	Line 0, Tip	37A	Line 0, Ring
29A	Line 1, Tip	30A	Line 1, Ring
2A	Line 2, Tip	3A	Line 2, Ring
9A	Line 3, Tip	10A	Line 3, Ring
36B	Line 4, Tip	37B	Line 4, Ring
29B	Line 5, Tip	30B	Line 5, Ring
2B	Line 6, Tip	3B	Line 6, Ring
9B	Line 7, Tip	10B	Line 7, Ring

Figure 46
Basic 500/2500 analog line card—typical cross connection example



Configuration

This sections outlines the procedures for configuring the switches and jumpers on the QPC452 Basic 500/2500 Analog Line Card and configuring the system software to properly recognize and configure the basic 500/2500 line card. [Figure 47](#) shows the location of the switches and jumper blocks on this board.

Jumper strap settings

There are no user-configurable jumpers or switches on the basic 500/2500 analog line card.

Software service changes

Individual line interface units on the basic 500/2500 analog line card are enabled or disabled using the Single-line Telephone Administration program (LD 10). See the *X11 input/output guide* (553-3001-400) for LD 10 service change instructions.

Figure 47
Basic 500/2500 analog line card—jumper block locations

